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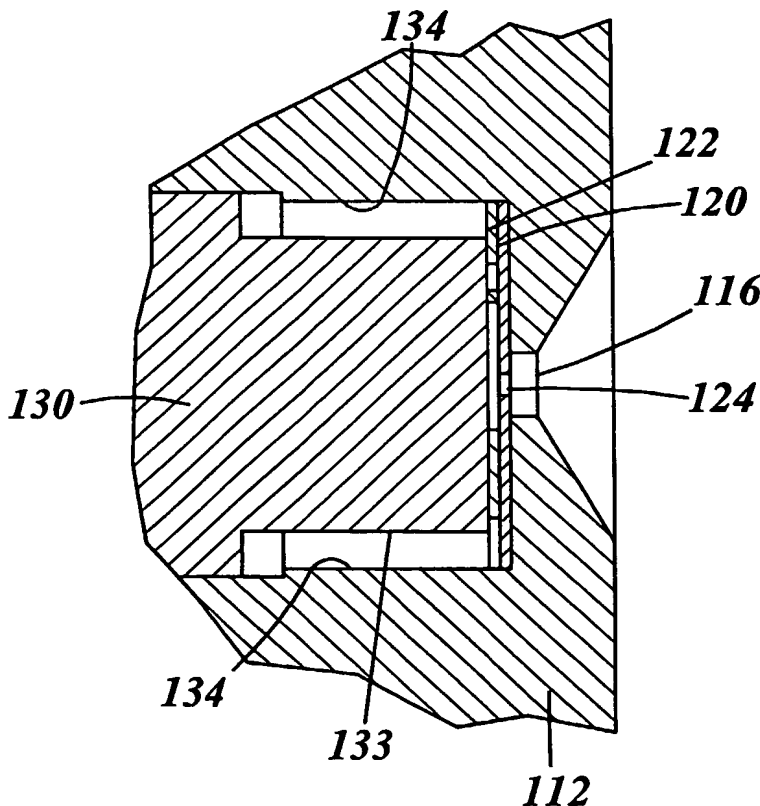
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[Continued on next page]

(54) Title: **SWIRL NOZZLE AND METHOD OF MAKING SAME**



(57) Abstract: A spray nozzle includes a body defining an inlet chamber and an outlet. An orifice disk, adjacent the outlet, has opposing surfaces, an inner sidewall extending between the opposing surfaces which defines an orifice, and a peripheral sidewall extending between the opposing surfaces for centering the orifice disk within the inlet chamber. A swirl disk, adjacent to the orifice disk, has opposing surfaces and a sidewall extending between the opposing surfaces. The sidewall of the swirl disk forms a periphery for centering the swirl disk, a hollow for creating a vortex adjacent to the orifice and an inlet for channeling fluid from the periphery to the hollow. A plug is fixed within the inlet chamber of the body for retaining the orifice and swirl disks as well as defining an annulus area in fluid communication with the inlet of the swirl disk.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B05B 1/34
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3,532,271 A (POLNAUER) 06 October 1970 (06.10.1970) See entire document.	14-32, 47-49, and 50-52
Y	US 2,719,755 A (STANLEY) 04 October 1955 (04.10.1955) See entire document.	14-32, 47-49, 50-52

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Date of the actual completion of the international search

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10 JUN 2004

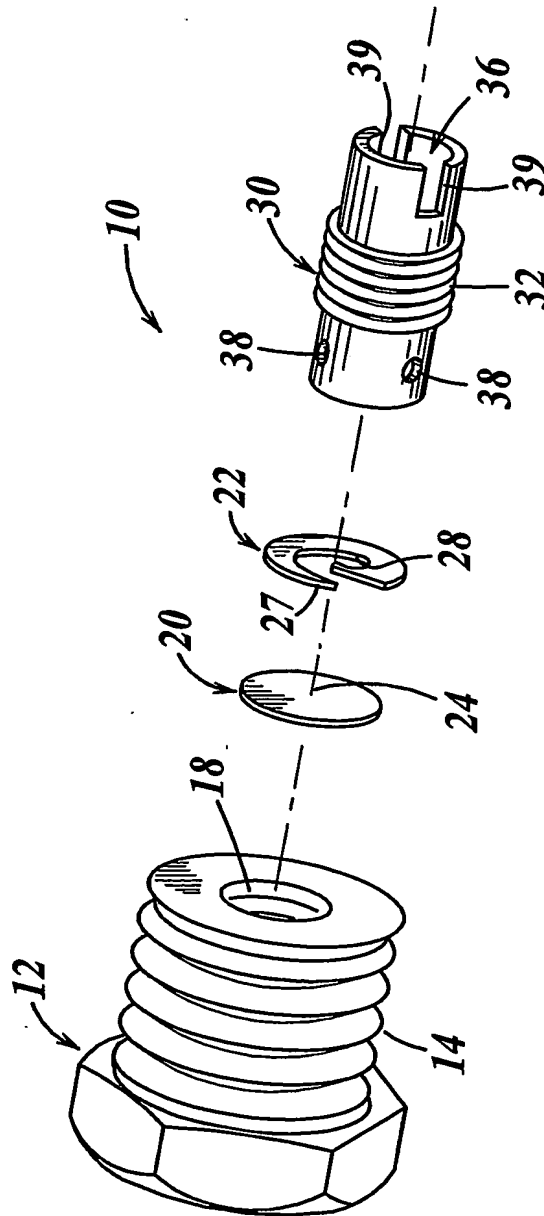
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FIG. 1

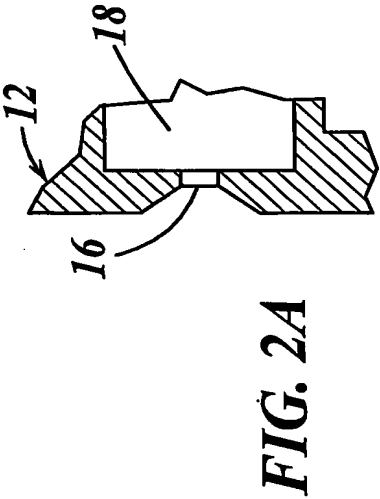
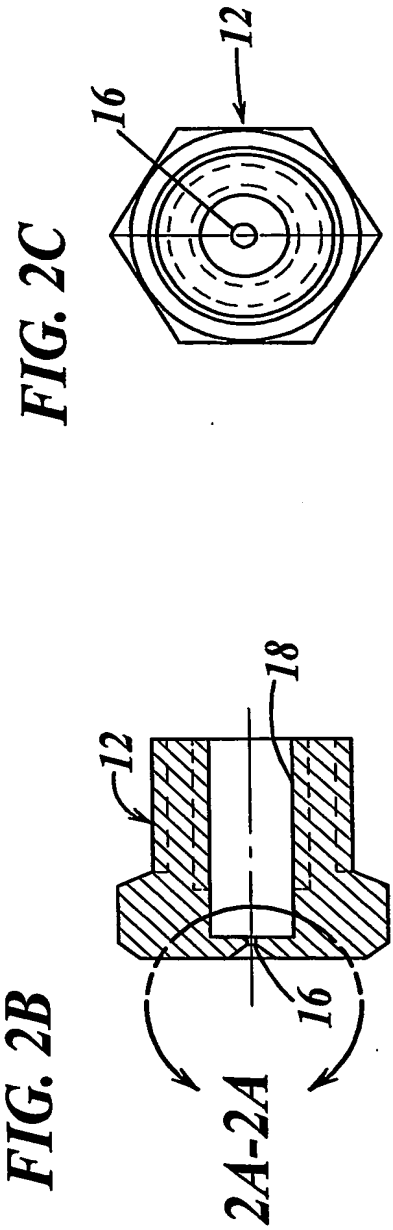


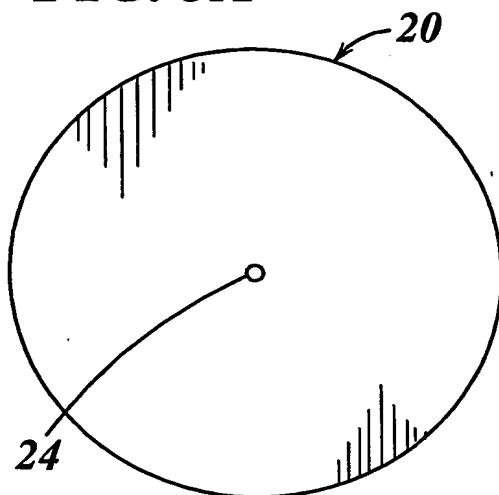
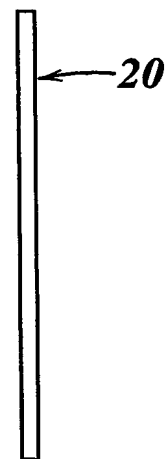
FIG. 3A**FIG. 3B**

FIG. 4A

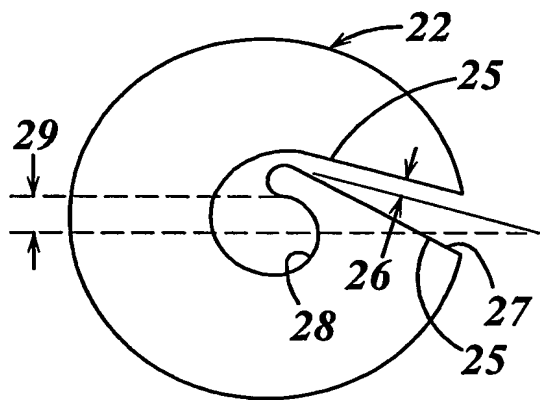
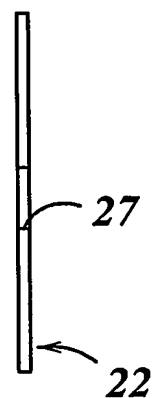
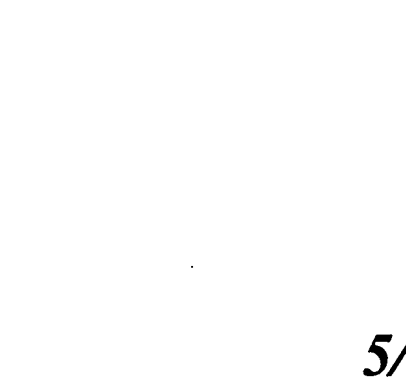
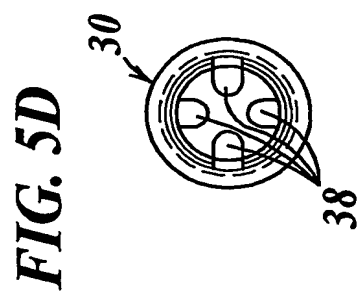
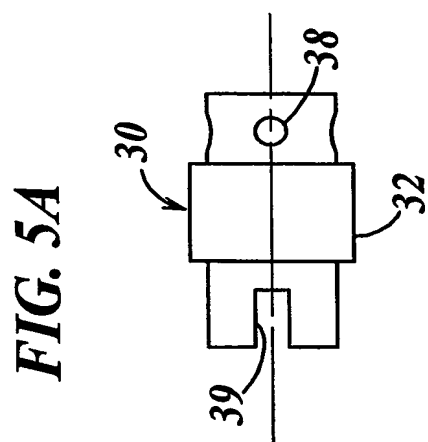
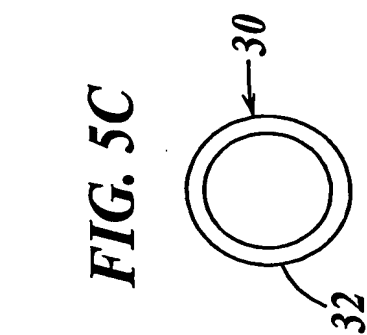
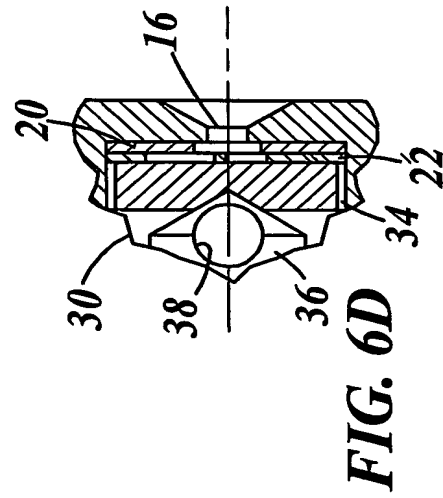
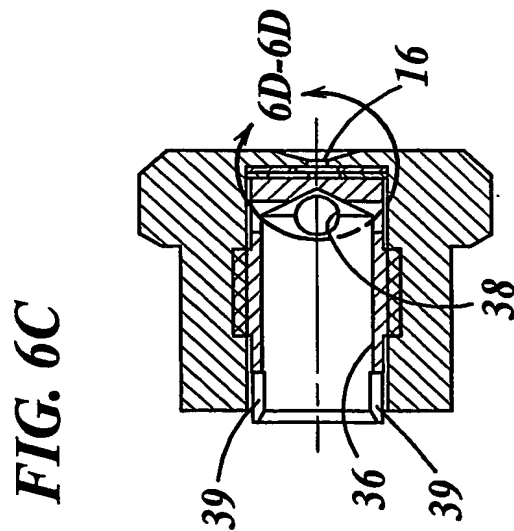
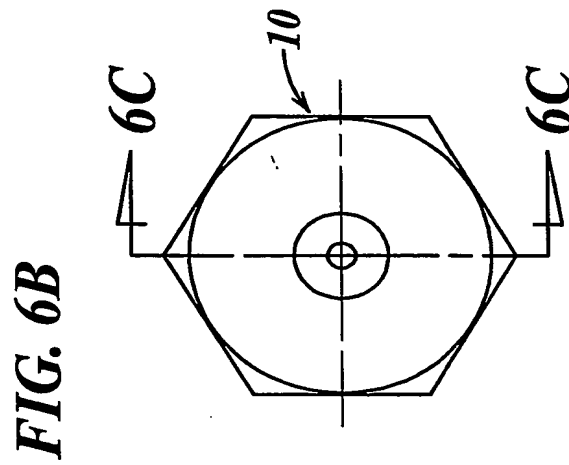
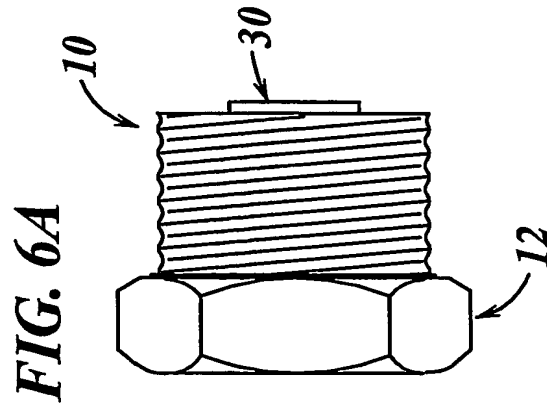


FIG. 4B







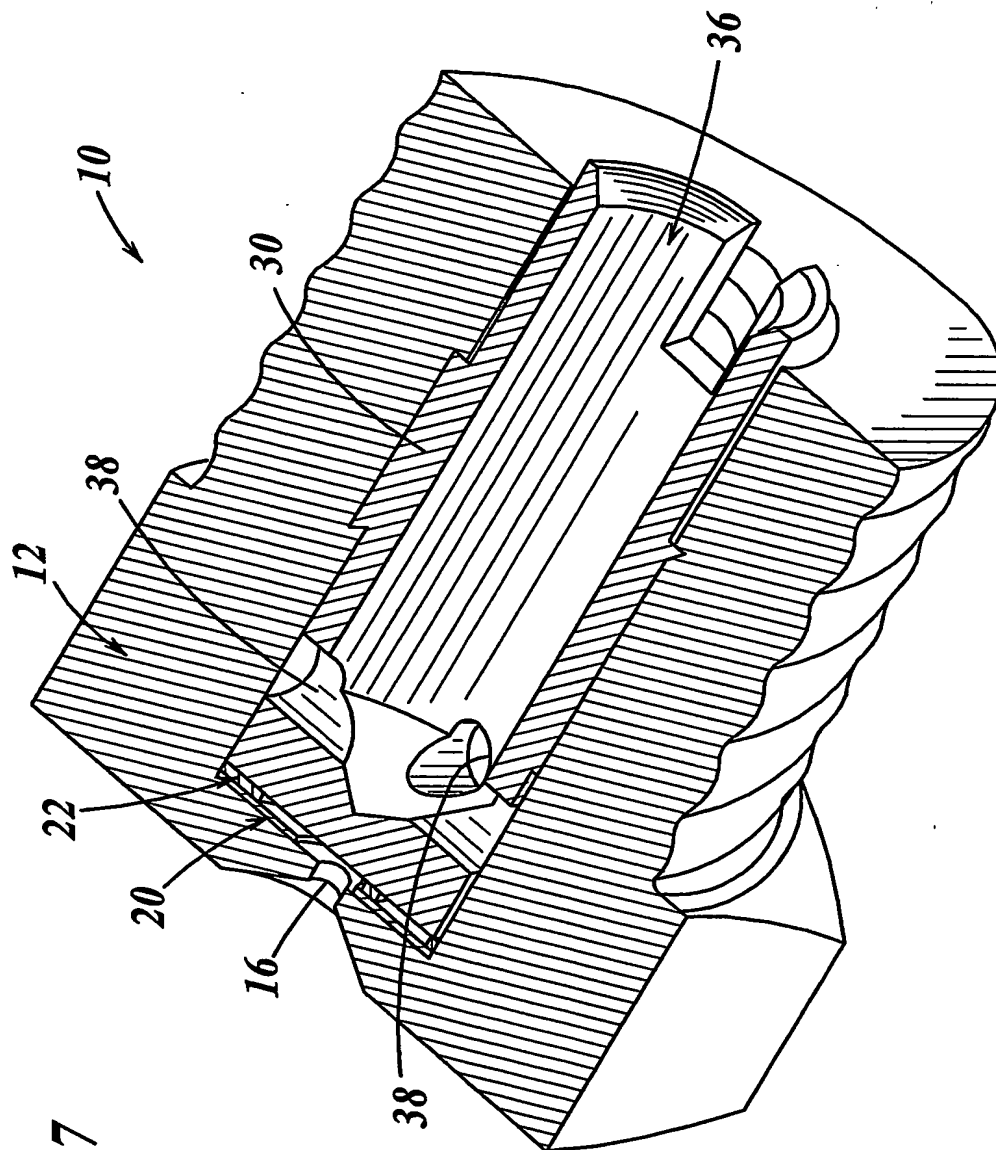


FIG. 7

FIG. 8

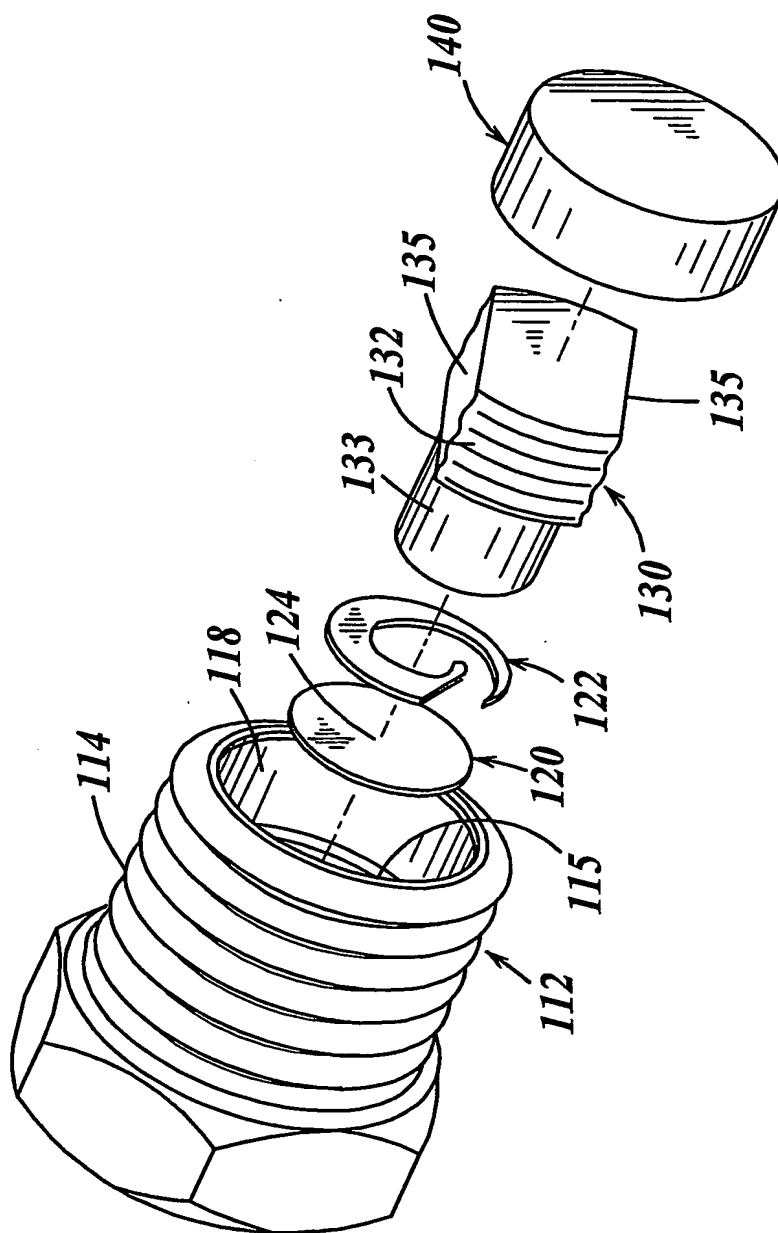


FIG. 9A

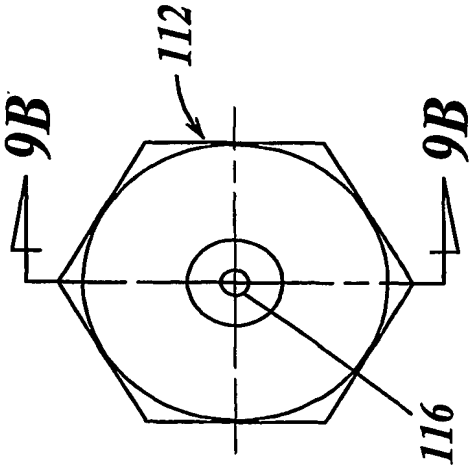


FIG. 9B

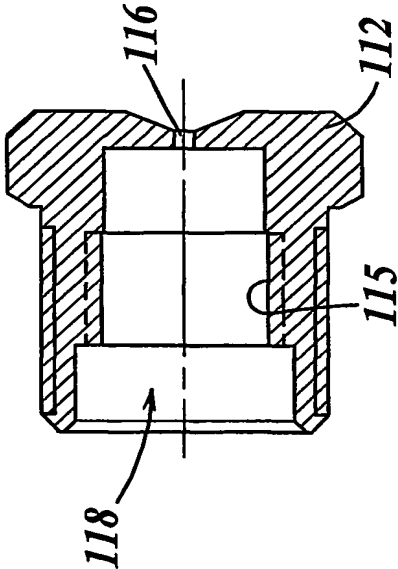
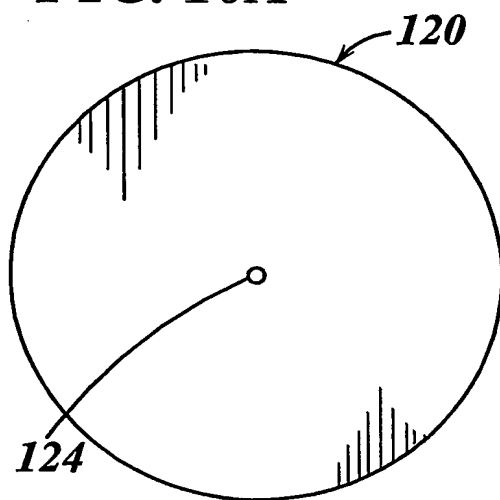
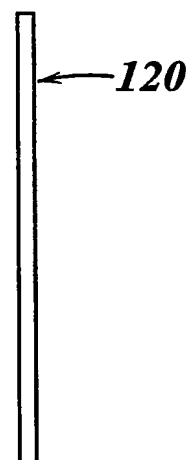
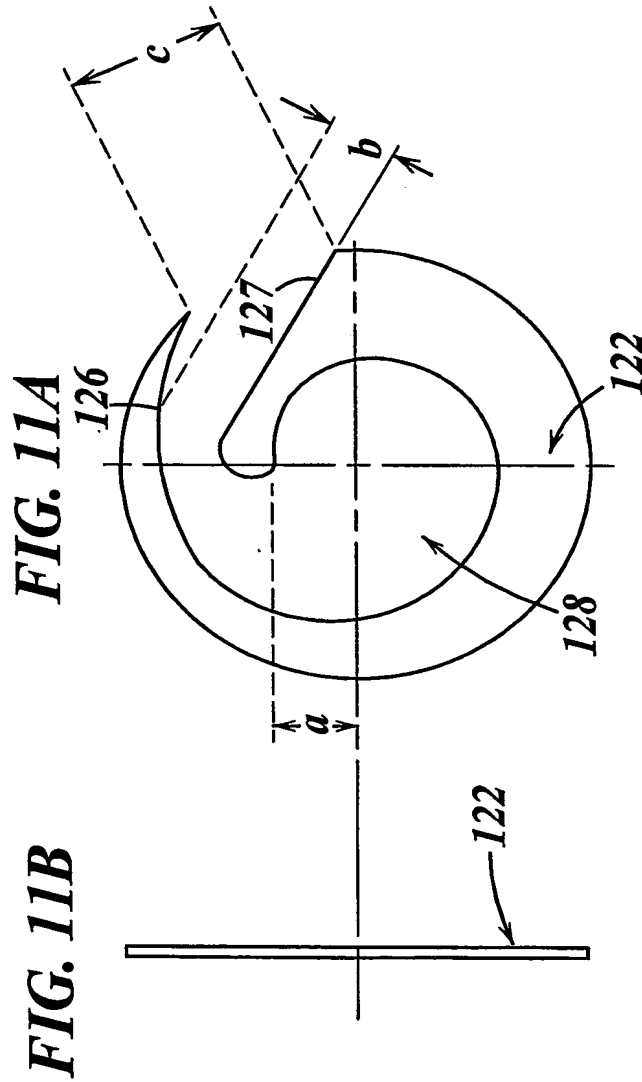
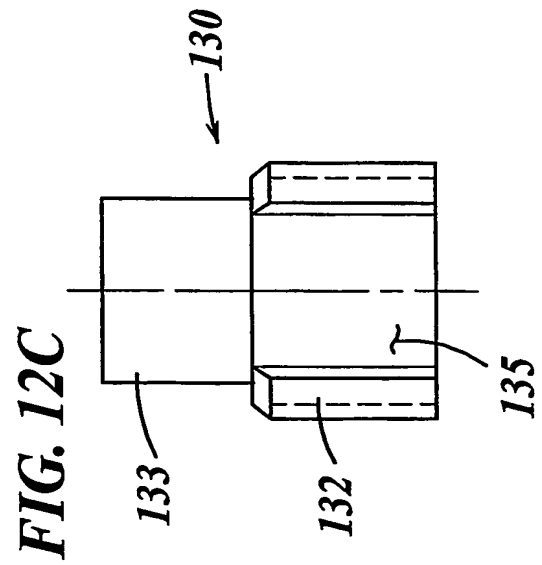
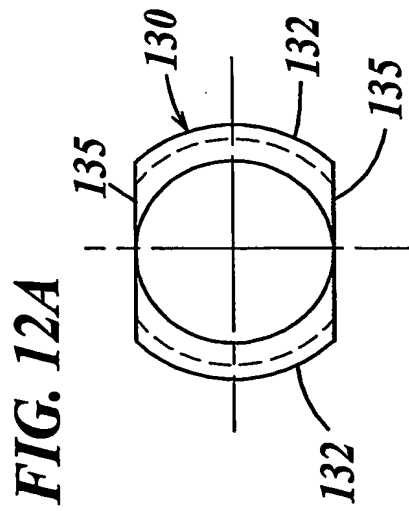
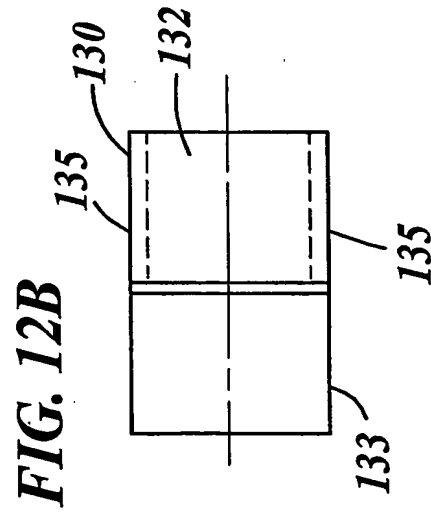


FIG. 10A**FIG. 10B**





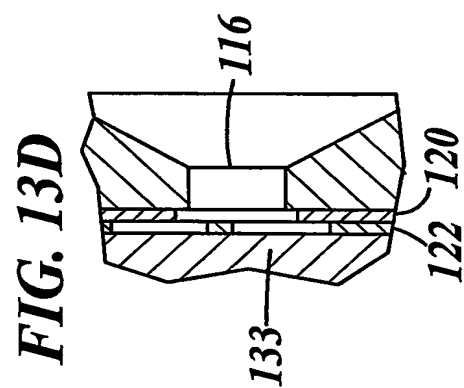
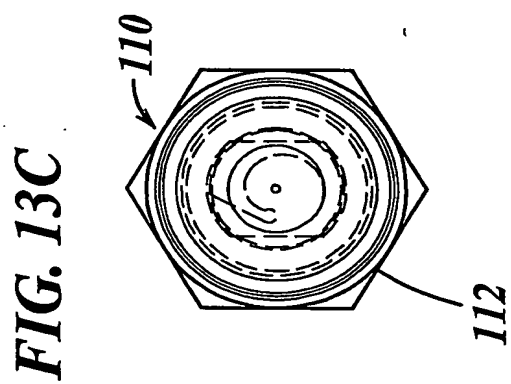
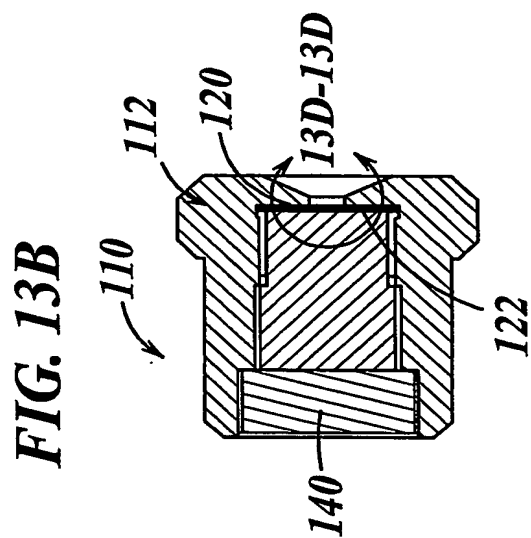
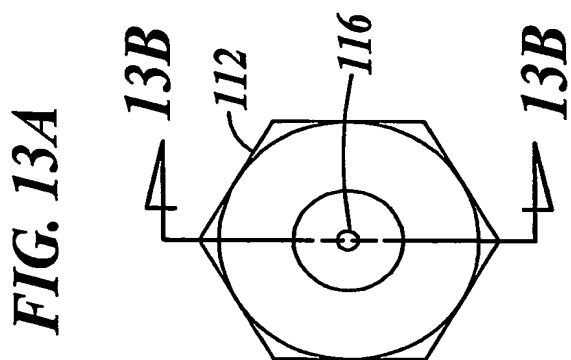


FIG. 13E

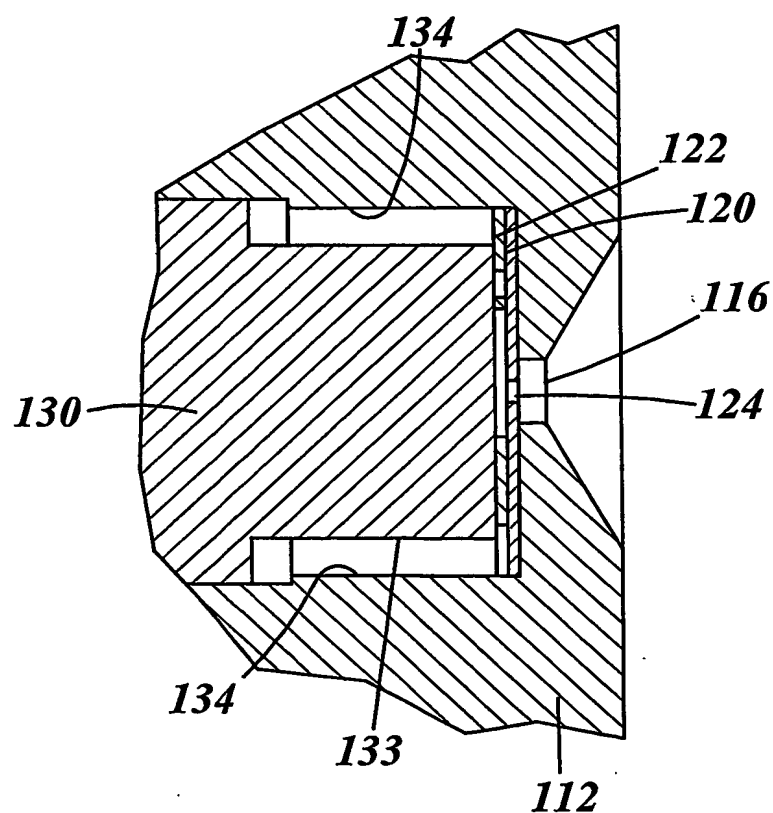


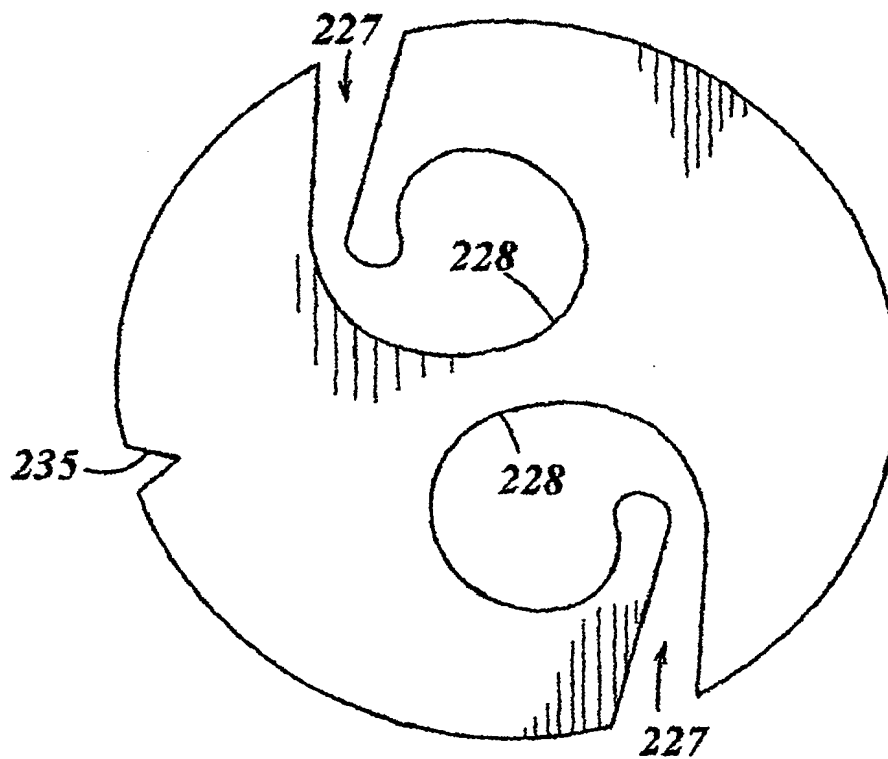
FIG. 14

FIG. 15

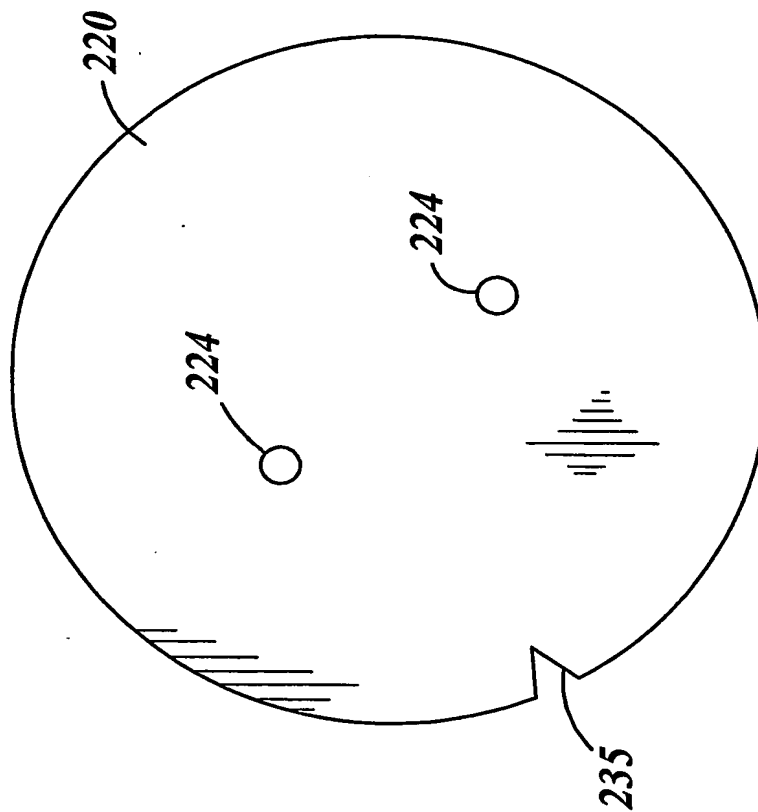


FIG. 16